

# **Political Facts of Life in the Development of the Interstate Highway System**

by

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## **1 Abstract**

By the 1950s the need for highways in the United States was increasing rapidly. Growth in both population and automobile ownership rates were the primary driving factors. Changes in development, social structures and increasing wealth also contributed to a growing demand for the need to move freely over longer distances. The current highway system was a combination of state and local efforts and failed to create an organized and effective highway system. This highlighted the need for a planned system at the federal level.

The size and scope and extended time frame necessary to complete the system presented a challenging engineering feat. This was not the first attempt to create a national highway system. The previous attempts failed not due to technical challenges but to politics. The expense of the system and its impact on the development of the country made it an important political issue.

This paper includes a brief history of the inception of the interstate highway system and an analysis of the role that political process played. This analysis will show the effects that five common themes frequently encountered referred to as political facts of life. Analysis of a few additional facts of life that are less commonly seen and new facts of life is also included. Knowledge of the impacts of the political process can aid in an understanding of why the interstate highway system developed the way it did. Perhaps more importantly an understanding how the interstate highway system was impacted by the political process can help in understanding how these same influences can affect current and future projects.

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## **2 Introduction**

The Interstate Highway System was a challenging engineering project. It was one of the largest and longest running public works programs in the history of the country. It involved the creation of 42,000 miles of interstates throughout the country in varying climates, geographies and geologies<sup>1</sup>. It has had a tremendous impact on the current make up of the country.

Creating the interstate highway system required overcoming many significant engineering challenges, but the political obstacles may have been equally as great. Building the system required spending tens of billions of dollars over decades. Combining the enormous sums of money with the extended timeframe and the systems impact on the country ensured it could not escape the effects of the political process.

The political process impacted the basic outline of the system and how it would be funded. The funding levels and requirements affected the progress of the construction of the system. A poignant example is whether to use pay as you go or bond financing. The design and routing of the highways also created controversies surrounding the construction of many sections, especially in urban areas. Other social and environmental requirements also impacted the system.

This political impacts will be analyzed in terms of common themes referred to as political facts of life. The analysis includes five common themes, a few additional themes and a few new ones that were identified during the analysis<sup>2</sup>. Understanding the impacts the political facts of life have had on the interstate highway system can aid in understanding how the system developed the way that it did. Also of importance is understanding how the interstate highway system was impacted by the political process can help in understanding how these same influences can affect other projects.

### **3 Historical Background**

The Interstate Highway System was one of the largest and longest running public works programs in the history of the country. Looking back it may seem inevitable that it would be created, but it took focused and persistent efforts to turn it from an idea into a reality. The system's creation required overcoming many significant engineering challenges as well as political obstacles that were equally as great.

#### **3.1 Lead Up to the Interstate Highway System**

The highway system of the United States in the early in 1950's was an unorganized collection of state and local highways with limited Federal oversight. As result highway planning between states was limited. There was also significant variance in the capabilities of state highway departments<sup>3</sup>. Growing populations and automobile ownership rates contributed to a need for a more organized system that would be capable of supporting the transportation needs of a modern economy.

The interstate system in its current form owes much of its structure to two reports to Congress in the years prior to World War II. The first *Toll Roads and Free Roads* (1939) and the second *Interregional Highways* (1944) took important steps forward in identifying how a network of highways would look. Both reports recommended a system of interregional highways with connections passing through and around cities<sup>4</sup>.

Earlier projects provided models and opportunities to build experience. The German Autobahns were a primary example of a modern highway system. Many soldiers serving in Europe during World War II including President Eisenhower were greatly influenced by what they saw in Germany. The United States also had their extensive system of railroads that provided an example of how a transcontinental transportation system could be structured. There was also much experienced gained that would prove valuable building bridges and tunnels for both the railroads and earlier highways.

An influential exhibit during the 1939 World's Fair in New York also went a long way toward generating public interest in a modern highway system. The exhibit designed by Norman Bel Geddes was entitled "Futurama" showed an imagined 1960s road network. The network included 14-lane super-highways crossing the country with cars travelling as fast as 160 km per hour<sup>5</sup>. Highways in cities were on multiple levels with higher levels reserved for through traffic and lower levels for local traffic.

The system also included high tech features such as radio beams that regulated car spacing that have not been realized even today<sup>6</sup>. While the concepts demonstrated were far beyond both what was possible either economically or technologically it went a long way toward popularizing the concept interstate highways.

Congress also saw the need for Federal highway system and passed the Federal-Aid Highway Act of 1944. This designated a 40,000 mile system of national highway systems. It would be created by joint action of the state highway agencies. The system would be overseen by the Federal Works Agency which contained the Public Roads Administration (PRA). The PRA under commissioner of Thomas H. MacDonald divided the system into 37,681 miles of principle highways and 2,319 miles for circumferential and distributing routes<sup>7</sup>.

The new highway system was seen by MacDonald and others as having a powerful impact on the future shape of cities. It was accordingly very important for the system to be designed to "promote a desirable urban development."<sup>8</sup> The highways were also expected to be important for national defense. The importance of an effective highway system for military operations was noted by soldiers returning from World War II.

Given all the benefits for building the new highway system the highway community was still divided. States were divided by differing appointment formulas, urban interests against rural interests and state verse federal authority. As result the Federal-Aid Highway Act of 1944 had come to no agreements over any of these major issues<sup>9</sup>. It only authorized a system there was still no commitment to build or funding for the new highway system. This would have to wait until 1956.

### **3.2 Federal-Aid Highway Act of 1956**

Progress until 1956 was slowed due to the effects of World War II and later the Korean War. Some work still went forward. The Public Roads Administration moved to get state's recommendations on routes for the interstate system and worked with local authorities on plans for larger cities. The PRA also made progress on creating design standards. The standards varied according to expected traffic, population density and topography<sup>10</sup>. The standards were based on traffic expectations for 20 years from date of construction.

President Dwight D. Eisenhower took office in January 1953 and proved to be a driving force in getting the highway system built. His enthusiasm can be traced to his experiences before taking office. In 1919, while Eisenhower was a young Army officer he participated in the Army's first transcontinental motor convoy. The trip took 62 days and

showed him firsthand the value of good roads. They experienced nearly continuous challenges with vehicles being stuck in mud or sand, extreme weather, mechanical breakdowns and even trucks falling through wooden bridges<sup>11</sup>.

Later as a General during World War II Eisenhower saw the how Germany benefitted from the autobahn highway system and he experienced the benefits as the Allies used the highways as they fought their way through Germany<sup>12</sup>. These experiences gave Eisenhower a vision of the importance of an efficient highway system. He turned his attention to highways in 1954 after the end of the Korean War.

Eisenhower was successful in getting the Federal-Aid Highway Act of 1954, but controversy around funding prevented any significant breakthrough being made. The primary controversy was how funding levels would be determined. Rural areas wanted to use land area and distance while heavily populated areas wanted population to have more weight. A compromise formula was agreed on but very little funding was made available because the controversy limited the level of commitment.

Eisenhower saw the 1954 bill as a start. The President's vision included a self-liquidating method of financing to avoid debt. He also wanted system created to foster cooperation between state and federal agencies<sup>13</sup>. He saw the federal state partnership as critical to successfully creating the system.

A committee led by retired General Lucius D. Clay was appointed by President Eisenhower to create recommendations on financing for the new highway system. Clay was an engineer and advisor to the President. The committee included a number of business and industry members. Their report was presented to the President in January 1955. It recommended issuing \$25 billion in bonds to be paid off over 30 years with revenue from gas taxes. Gas tax increases would not be necessary because increased traffic would increase revenues<sup>14</sup>. The President forwarded the recommendations to Congress.

Senator Harry Byrd of Virginia who chaired the powerful Committee on Finance strongly opposed the Clay Committee plan. His primary opposition was due to the use of bond financing. Byrd had a strong aversion to debt and wanted to avoid the expected \$12 billion in interest payments. He advocated a pay as you go system where construction for sections would only be authorized as revenue came in. Byrd also objected that the debt would be controlled by an organization outside Congressional control. The Clay Committee plan was voted down 60 – 31 in the Senate and 221 to 193 in the House.

Senate Albert Gore of Tennessee created his own proposal to that would continue 1944 bill but with \$10 billion of funding through 1961. It also increased the federal share of funding to 75%. The plan had one significant weakness; the US Constitution requires revenue legislation to originate in the House of Representatives. As result Gore's proposal did not specify how it would be financed.

In the House, Representative George Fallon of Baltimore, chairman of Sub-Committee on Roads co-authored a bill with Representative Frank Turner. Fallon created his plan because he expected the Clay Committee plan would have little chance of surviving a House-Senate conference even if it did make it that far. Notable features of the bill were 90% federal funding and its use of highway user tax increases for funding. The bill in an effort to promote the nation defense benefits for the highway system the name of the project to “National System of Interstate and Defense Highways.” This name was accepted and was used in future bills. Surprisingly the Fallon bill was voted down in 292 – 123, which surprisingly defeated by larger percentage than the Clay Committee bill. The defeat was largely blamed on intense lobbying activities by the trucking, petroleum and tire interests<sup>15</sup>.

This ended the legislative session in 1955. Chances for passage of a highway bill looked less promising in 1956, a Presidential election year. The Democratically controlled Congress was seen as unlikely to pass prominent legislation that was prize project of a Republican President during an election year. There were a few significant occurrences that changed the outlook.

First a report was issued to members of Congress that proved key in changing members of Congress perception of the highway system. The report was entitled: *General Location of National System of Interstate Highways Including All Additional Routes at Urban Areas* and quickly became known as the Yellow book due to the color of its cover<sup>16</sup>. It contained detailed maps showing the locations of the planned highways. What this did is showed members of Congress how this would benefit their districts and gave them something they could go show to their constituents.

During this time the highway interests were also reassessing their views and clarifying their concerns. One concern felt by the trucking industry was that they were willing to pay their share, but no more. In the Fallon bill the diesel tax hike was from 2 to 4 cents compared to a hike of only 2 to 3 cents for gasoline. Many highway interests also realized that even if they needed to pay more taxes to pay for the highways they would benefit so much from the highways being built they would come out ahead<sup>17</sup>. Others who supported the highways assumed the bill would pass so they didn’t actively lobby in support. They increased their efforts in 1956.

Details for revenue generation and appropriations were also agreed on. Funding would be appropriated on a cost-to-complete basis with the ratio of state’s cost to total cost for all states. The project would also be financed pay as go you go with revenue being directed to a trust fund. Eisenhower preferred issuing bonds so the money would be available sooner, but he relented to Senator Byrd because he wanted to get the bill passed. Byrd also added an amendment that would lower distributions to states on a pro-rated basis if the trust fund balance went below a threshold. The bill authorized \$25 billion to be spent between 1957 and 1969.

The bill passed overwhelming 388 – 19 in the House and 89 – 1 in the Senate. In May 1956 the Fallon bill from the House and the Gore bill from the Senate went to

conference. One compromise made was to appropriate funds by mileage, land area and population for the first three years as in the Gore bill and then on a cost-to-complete basis as in the Fallon bill for the remaining years. On June 29, 1956 the bill was signed into law by the President<sup>18</sup>.

### **3.3 Construction Begins**

Work started quickly with a number of contracts being awarded shortly after the bill was passed. A Federal Highway Administrator position was created to oversee the construction of the new highway system. John A. Volpe, the founder of a large construction company, served as interim Administrator until the Bertram D. Tallmay was available. Tallmay also came from a contractor background and had served in a number of public works departments<sup>19</sup>.

A long-time controversy was resolved in 1957 when 2,102 miles of turnpikes was incorporated into interstate system. There had been much disagreement about how to handle highways already built by states and how or if to compensate states for projects already completed.

The Federal-Aid Highway Act of 1956 mandated that uniform design standards be used in the construction of the highways. Responsibility for creating the standards fell to the American Association of State Highway and Transportation Officials (AASHTO). The standards would cover all aspects of the highway design included materials, technical characteristics and signage. The design standards were intended to meet needs for 20 years from construction. AASHTO created example roadways and conducted road tests to try alternative concrete and pavement designs to create the standards.<sup>20</sup>

The Federal-Aid Highway Act of 1956 contained a requirement for public hearings when proposed highways were expected to have an economic impact to cities or towns<sup>21</sup>. This came to be a significant challenge on progress in many areas. It required engineers and administrators to develop public relations skills to work with the diverse individuals and organizations the highways would be affecting. This was especially large challenge in urban areas where an estimated half of the \$27 billion budgeted for the interstates would be spent.

### **3.4 Challenges in Urban Areas**

In the 1950's many urban areas were in decline. Mayors, city councils and business interests in many of these cities saw the highways as a way to reverse the decline and restore their tax base. In many cases a primary method of effecting change would be to use the highways to displace blighted areas.

This view was not universally held. Others in opposition accused these urban interests of having a narrow view and not addressing the real problems<sup>22</sup>. They saw the highways in urban areas as splitting and destroying established neighborhoods resulting in a host of social and economic problems.

### 3.5 Financing Challenges

Construction of the highway system encountered a number financing challenges.

The President saw the interstate construction as a program that could be expanded or contracted to help the economy. It didn't take long after passage of the bill for it to have an opportunity. A recession in 1957 increased unemployment by 7 percent. Beginning in 1958 Congress passed additional funding for interstates. This change was made without an increase in taxation so it resulted in a deficit in the Highway Trust Fund which required suspending a provision in the 1956 bill referred to as the Byrd Amendment intended to maintain a minimum fund balance<sup>23</sup>.

With the Byrd amendment suspension expiring in 1961 highway spending would need to decrease. Eisenhower recommended a temporary 1.5 cent gas tax increase in an effort to main the construction schedule, but only 1 cent was approved by Congress.

Construction costs were also coming in higher than expected. Critics charged the increasing costs to fact that Federal Government was paying 90% of costs, so states had little incentive to control costs. While this may have contributed other factors were clearly driving cost increases.

### 3.6 Increasing Costs

Estimated completion costs continued to increase throughout the construction of the system of the interstate system. Between 1958 and 1975 estimate costs increased from \$37.6 billion to \$89.2 billion<sup>24</sup>. There were a number of factors contributing to this increase including construction costs, mileage increases, traffic forecast changes and social, economic, safety and environmental requirements<sup>25</sup>. These increasing costs are shown by category in Table 1 based on data in a 1975 GAO report<sup>26</sup>. All figures are in millions of dollars.

Table 1: Estimated Interstate System Cost Increases between 1958 and 1975

	<b>Estimated increase: 1958-1972</b>	<b>Estimated increase: 1972-1975</b>	<b>Total estimated increase: 1958-1975</b>
<b>Construction price increases</b>	9,230	5,870	15,100
<b>Right-of-way and relocations increases</b>	2,743	1,060	3,803
<b>Mileage increase and system adjustments</b>	8,515	30	8,545
<b>Upgrade roadway and structure designs</b>	5,970	2,355	8,325
<b>Social, economic</b>	2,256	1,110	3,672

<b>and environmental requirements</b>			
<b>Traffic forecast changes</b>	1,834	515	2,349
<b>Additional safety requirements</b>	1,865	0	1,865
<b>Added interchanges and separations</b>	1,704	160	1,864
<b>Preliminary engineering increases</b>	1,021	515	1,536
<b>Project overruns</b>	0	257	257
<b>Mass transit fringe parking</b>	125	0	125
<b>Sub-total increases</b>	35,569	11,872	47,441
<b>Administrative, planning and research</b>			4,189
<b>Total increases</b>			51,630
<b>1958 estimated total cost</b>			37,570
<b>1975 estimated total cost</b>			\$89,200

First the decision to use pay as you go instead of bond financing resulted in a longer period of time to collect funds for construction. When combined with unexpected increases in vehicle fuel economy which reduced gas tax revenues this resulted in a relatively level funding level which lengthened completion times. Extended completion times normally result in higher costs due to reduced efficiencies and increasing material and labor costs.

Construction costs increases was the largest cause of the costs increases. According to a 1975 GAO report construction costs for new segments would be more than four times the cost per mile of already completed segments. This was especially acute in urban areas where the cost increase would be six times more<sup>27</sup>.

Another area contributing to significant cost increases were changing design and safety standards<sup>28</sup>. These changes were made a combination of reasons including traffic forecast changes, safety and environmental requirements. All sections were required to be a minimum four lanes for traffic; originally sections with limited traffic were permitted to be 2 lanes. Additional interchanges, overpasses, landscaping, beautification, erosion control and rest areas were added. Design standards were also upgraded to mandate more durable roadways and shoulders and wider bridge widths to accommodate heavier traffic.

Inflation was also eating away at revenue and increasing costs. This was harmful because revenues which were collected as cents per gallon of gasoline which created flat revenues, measuring the taxes as a percentage of gasoline prices would have provided some relief. In addition higher gas prices caused people to drive less and to obtain more fuel efficient vehicles. Also contributing were construction prices which were increasing faster than inflation.

#### **4 System Description**

The Interstate Highway System as conceived in the 1956 Federal-Aid Highway Act consisted of 41,000 miles of interstates. Of these 6,000 would be urban, city, and connecting route. This was increased to 42,500 in 1968 and finally to 46,876 in today's system. The system includes major east-west and north-south routes as well as spur and beltway routes around major cities.

The system was originally expected to take 13 years to construct. The construction time was extended several times due to funding, technically and political challenges. Many extensions added to the system over the years make selecting a completion date difficult, but the 1992 completion of I-70 near Denver is often cited<sup>29</sup>.

The original 1956 bill included some minimum standards for the interstate system, but most of the details were left to be worked out by the American Association of State Highway and Transportation Officials (AASHO). Congress knew it was important to impose uniform standards to ensure the safety and durability of the road network in addition to consistency for travelers. The standards have been revised and upgraded over the years to comply with changing environmental, safety and social requirements.

The highways were required to have full access control meaning all access to the roadways would be via interchanges and grade separations. Bridges and overpasses would be needed to prevent the need for railways or other roads to cross the highways. Full access control seemed to be over-design for some especially in rural areas. This resulted opposition in some rural areas where local residents were not-accustomed to driving a few miles to get on a highway that was right next to them. Full access control was maintained partly to ease traffic but mainly due to an expected 2/3 reduction in accidents<sup>30</sup>.

Initially two lanes and at grade intersections permitted in low traffic areas, then beginning in 1966 four lanes and no at grade crossings were permitted. The AASHO created minimum standards for lane width (12 feet) and clearance for bridges and overpasses (14 feet). This was later revised to 16 feet due the need to transport military equipment<sup>31</sup>. The AASHO standards also include minimums that vary depending on the circumstances including shoulder width, pavement slope and grade.

The AASHO also created standards for concrete and pavement designs to ensure durability. To develop many of these standards the AASHO conducted a series of tests where they built a number of different sections of roadway then drove heavy trucks over

them for a period of 2 years to see how the different designs held up. The AASHO pioneered a number of advances concrete, asphalt, drainage, bridges, and safety such as break away signs<sup>32</sup>

## **5 Political Facts of Life**

Politics inevitable drive much of what happens in large technology and engineering projects. This is both a result of the large amounts of money involved and often the significant impact the project could have on the society. The politics of engineering projects can be considered in terms of political facts of life as described by Dr. Brenda Forman<sup>33</sup>. These facts of life describe common themes that show how the political system affects engineering and technology projects. These same themes can be seen over and over again in all types of project both in currently and in the past. As well be seen these facts of life can influence the fundamental nature of projects as well as whether or not the project can continue.

The facts of life can be organized into five primary facts that are mostly commonly seen and can have the greatest impact on projects. There are also other facts of life that commonly present themselves. In addition some new facts of life can be identified.

Conceiving and constructing the United State's Interstate highway system highways was no exception to the effects a political system can have on a project. Constructing the highway system would involve working with 46,000 government units according to Senator Edward Martin of Pennsylvania<sup>34</sup>. He saw this has threat to undermine overall function of highway system. The following analysis will show what effects the political process did have on the creation of the highway system.

Obtaining and keeping funding is essential to a program's success. Without funding it will out of necessity be canceled. Getting funding is a political exercise. Those in positions of authority and influence over funding need to be convinced of the worth of project over all of the other projects that are also competing for funding<sup>35</sup>. Maintaining funding requires keeping them convinced is of course also a political exercise.

A project can also be limited by restrictions placed on funding. For example money could be held back until a particular change is made or funding could be restricted to only be used for particular purposes. The technology is often capable of doing more than what budgets allow. These limitations can force projects to be reduced in scope or redesigned to fit within the restrictions. The interstate highway system encountered a number of these challenges that imposed changes on the system.

One of the most significant effects from this type of political fact of life resulted from the building sections of the interstates in urban areas. Many of these sections became very controversial as competing interests sought to influence where, how or if sections should be built. There were a number of parties involved including federal, state and local transportation officials and politicians, local residents and businesses<sup>36</sup>. Some wanted

highways built directly through urban areas in an attempt to alleviate traffic getting in and out of downtown areas. Others wanted highways to go around downtown areas.

Many of these groups held very strong views. Transportation officials generally wanted to built highways though downtown areas. Downtown business interests were generally in favor as they saw highways as making it easier for customer to reach them. Many residents and neighborhood interests were very concerned the highways would destroy and split many neighborhoods. Local politicians were generally in favor of building the highways through downtown areas. In addition many saw the highways as a way to remove blight in urban areas.

The public hearings, legal battles and reviews necessary to resolve these controversies resulted in significant delays to many sections in urban areas. Many of these controversial segments were highlighted in a 1975 GAO report<sup>37</sup>. This of course resulted in higher costs which further slowed progress as additional projects were delayed due to lack of funds. This is because the amount of money was fixed to what was received in gas tax revenue.

The 1956 Federal-Aid Highway Act provided states with 90% Federal matching for highway projects meeting the Federal standards. This made highway projects very favorable when considering other transportation projects including mass transit, rail or other road projects that would not receive the Federal dollars. This greatly influenced states decisions on what projects to pursue and diverted funding away from other projects<sup>38</sup>.

The decision to provide states with the Federal matching dollars was a political decision to encourage the construction of the highways. This limited what could be done in other types of projects as funding was diverted away because without the Federal funds they were not much less favorable economically compared to the highway projects.

Even with the 90% Federal matching states were sometimes unable to come up with the necessary funds to construct some sections on schedule<sup>39</sup>. This slowed progress as sections were delayed waiting for states to come up with their share of the funding. Without the requirement for 10% state contribution the delays would not have been necessary.

As the highway construction continued throughout the country some of the negative impacts of the highways became more pronounced. This resulted in additional sociological and environmental requirements being added. These requirements lengthened schedules and added cost. Further design changes were also made to improve safety and increase capacity<sup>40</sup>. The added costs further extended schedules due to the fixed funding source.

Continued funding is essential to any project. Funding is also always limited. To get started some projects have used optimistic assumptions or creative solutions in order to arrive at an acceptable cost. The budget process also at times only provides a portion of

the requested funding; this can lead to schedule stretch-outs and often higher costs in the long term<sup>41</sup>.

Determining the financing method for the interstate highways was one of the most lengthy and challenging politically of the project. Gas tax revenue had already been identified as the primary source of funding. The remaining question was whether the project would be financed pay as you go where project progress would be determined by incoming revenue or by issuing bonds and then using the incoming revenue to pay off the bonds.

President Eisenhower preferred debt financing because it would allow the project to be completed faster with all of the money available up front. This was strongly objected to by Senator Harry Byrd of Virginia who chaired the powerful Committee on Finance. He objected to the \$12 billion expected to be spent on interest as well as having an aversion to debt. Eventually the President relented and agreed to pay as you go financing. This resulted in a longer time to complete the project and likely higher overall costs as construction costs increased over the years<sup>42</sup>.

Funding for the highways was limited to revenue from gas tax. This provided a fixed revenue stream. This limited project progress as sections of the highway could only be built as funds from gas tax were available. The scheduled completion date slipped as gas tax revenue did not increase as quickly as expected due to world events that raised gasoline prices and cars being introduced with higher fuel efficiency. Both contributed to a lower demand for gasoline.

In 1960 the slipping construction schedule prompted President Eisenhower to propose a temporary 1.5 cent gas tax increase in an effort to main the construction schedule. Congress only approved a 1 cent increase which resulted in a slowing of progress<sup>43</sup>. Members of Congress were clearly leery of raising taxes too much.

The interstate highway system was presented as serving both civilian and defense needs. Civilian users needed the system to enable individuals and goods to be efficiently transported both regionally and country wide. Defense interests saw the highways as a way to efficiently transport military hardware, supplies and personnel efficiently in time of war. While they shared many common requirements they did have different agendas and their needs did not always align.

A prominent example is the minimum height for overpasses and bridges. It is desirable for this height to be as low as possible to save on construction costs and complexity. Commercial users needed a minimum height of 14 feet for trucks, while military users required a minimum of 16 feet for some specialized equipment<sup>44</sup>. Unfortunately, the higher military requirement did not come to light until hundreds of miles of interstate had already been built at the lower standard.

Increasing the height would be very expensive as hundreds of bridges and overpasses would have to be rebuilt. The military believed this was important to meet their needs.

Commercial users preferred the funds instead be spent building additional highways. A compromise was reached to change the standard for new construction and increase overpass heights as they required major work.

Another area where the military differed with civilian users was whether highways should be built around or through cities. The military preferred routes going around cities to miss traffic congestion, but primarily to save cost<sup>45</sup>. The prevailing civil interest was passing through cities to provide better access to downtown areas.

A project must have a strong constituency to maintain its political influence and as a result it's funding. These constituencies can come in many different types and of varying strengths that can influence the political process in unique ways. Congressional representatives, business interests, political organizations, other organizations and even individuals are all constituencies whose support can help make a project possible.

Most projects require multiple constituencies who often have different priorities and may be supporting the project for different reasons<sup>46</sup>. Trying to support multiple constituencies can pull a project in different directions. Changes to help one constituency can at times alienate another constituency. It can be a difficult political undertaking to obtain and keep a constituency together to ensure continued support for a project.

The Interstate Highway System had the significant advantage of being championed by the President of the United States, but this alone is not sufficient. The project did not receive funding until members of Congress were convinced of its worth also. There were multiple occurrences that contributed to gaining their support. One of the most significant was the issuance of what became known as the yellow book in 1955. Its official title was the *General Location of National System of Interstate Highways Including All Additional Routes at Urban Areas*. The effect it had was showing members of Congress how their districts would benefit from the proposed highway system. It also gave them something to go back to their districts to explain to their constituents why they were supporting the legislation<sup>47</sup>.

The highway system also had an advantage over many other projects because the benefits including jobs from construction and the new roadways would be spread throughout the country. This helped the highways to obtain and maintain widespread support in Congress because all members of Congress would have a stake in it. As result the construction industry was active in lobbying for the highways<sup>48</sup>.

Prior to the successful passing of the Federal-Aid Highway Act of 1956 a number of other bills were debated and voted on. One prominent example was the Fallon bill that was widely expected to pass, but ended up failing by a fairly wide margin. This served as a wakeup call to the many highway interests including tire, petroleum and trucking companies. Prior to the Fallon bill they did not actively lobby for highway legislation because they expected it to pass even though they stood to benefit greatly from the new roads. Their efforts greatly increased afterwards which helped get the final legislation through<sup>49</sup>.

Surprisingly some trucking interests lobbied against the Fallon bill even though the new highways were expected to significantly lower shipping costs and reduce travel times. This can be traced to a feeling that they would be paying more than their share of the new highways. Trucks primarily run on diesel which was planned to receive a higher tax increase than the gasoline used primarily by cars. One of the changes made in later legislation was to set the planned diesel tax increase to the same as the gasoline tax increase<sup>50</sup>. This helped to gain their support. Also contributing was the realization that the highways would not be built until legislation passed.

Urban sections of interstate highway system proved to be the most challenging politically even though they made a small percentage of the total system mileage. There were far more interested parties both for and against different options, many of which had significant political strength than in rural sections. The routing and structure of the highways of the highways would have an enormous impact on neighborhoods and cities. Also of high importance was that urban sections were by far the most expensive sections of the highways and anytime there is lot of money involved politics will play a strong role.

These competing interests sought to influence where, how or if sections should be built. These parties included federal, state and local transportation officials and politicians, local residents and businesses. Some wanted highways built directly through urban areas in an attempt to alleviate traffic getting in and out of downtown areas. This was the view favored by most transportation officials and downtown business interests who saw the highways as a way to make it easier for customers to reach them. Local politicians were generally in favor of building the highways downtown. They saw highways downtown as a way to reverse urban decline and to remove blight<sup>51</sup>.

Others wanted highways routed around downtown areas to keep neighborhoods intact and to minimize the number of residents and businesses being displaced. This was the view held by many residents and small businesses. In a few cases these groups were able to re-route or hold up construction. Prominent examples include highways in San Francisco, Baltimore and New Orleans<sup>52</sup>. In nearly all other cases however the highways were built through urban areas. Much of this can be attributed to the disproportioned split of political power between those for and against the highways in urban areas.

Technical problems can be a major challenge for any project. When these problems occur they can create even more vexing political problems. These problems can result from limited technological maturity, slow development progress or changes mandated or requested in a project. These challenges can result in schedule extensions, budget over runs or even questioning of project feasibility<sup>53</sup>.

Even when technical problem can be readily corrected, the political problem can continue. Unfortunately the perception of how serious the problem is can have a more serious impact than its real effect. These issues are often brought the attention of the political process by reports. Often times these reports will even be requested or authored

by individuals or groups opposing the project. They may attempt to turn a minor technical setback in a major issue to use to gain leverage in hopes of scaling back or canceling the project.

The AASHO created the standards the new highways would need to follow to receive the Federal funding. One of these standards was the minimum vertical height for bridges and overpasses. It is important that this standard be high enough to allow nearly all expected traffic to be able to safely pass underneath. The standard also needs to be as low as possible to minimize cost. Initially the standard was 14 feet. It wasn't until several hundred miles of interstates with hundreds of bridges and overpasses had been built that it came to light that the military needed a 16 foot height for some of its specialized equipment. This would necessitate time consuming detours around bridges that were too low which would negate much of the expected benefits from the highways.

This created a significant technical problem that became a political problem because one of the primary purposes for the new highways was to aid in the transportation of defense equipment. The only two solutions: lowering the road way or raising the bridges and overpasses were both very expensive. The military was clearly in favor of increasing the clearance. Commercial users were in favor of instead using the funds to continue the construction of more highways. Eventually a compromise was reached to upgrade the standard for all future construction and to increase the clearance when major work was performed on sections with the lower heights<sup>54</sup>.

Another key standard for the interstate highways was for full access control. This meant that vehicles could only enter and exit the highways using widely spaced interchanges. This was an important innovation to maintain the flow of traffic but most importantly for safety<sup>55</sup>. By limiting the entrances and exits to established interchanges safety was greatly enhanced. Full access control may have seemed excessive to some especially in rural areas with minimal traffic.

Requiring full access control also became a political problem in some areas. Rural users often had to travel miles to reach an interchange to enter the highway even though they may have lived right by the highway. They didn't understand the need to limit the entrances and exists. In this case the political problem was able to be overcome by appealing to those with more political strength and educating residents about the benefits of access

The new highways were designed to meet the traffic needs for 20 years after construction. This created two sets of political problems. This meant that some roads would be expected to be significantly underutilized for many years after construction was completed raising concerns about waste. This concern was often heard about new multi-lane rural highways that were expected to receive little traffic. The politicians and organizations raising these concerns were often those wanting more funding for their projects.

Underutilized highways turned out to be much less of a problem than over utilized roads as most highways received significantly more traffic earlier than expected. The resulting congestion created a political problem for Federal and state highway departments as well as politicians. Highway departments were put under pressure for not better forecasting the traffic that would result.

The schedule delays in building some of the highways also contributed to the congestion problem with many sections built longer after they were planned. There were calls to expand some of these highways; some not long after completion. At the same time highway departments were still trying to build new sections of the highways. Both of these efforts were making competing demands on the same limited funding.

Engineers and politicians look at problems and solutions very differently. This is because engineers and politicians are going to have very different priorities as well as concerns. In addition politicians may have a limited technical understanding that could lead them to favor an inferior technical solution. As result excellent technical solutions may be deemed political unacceptable or less desirable than others. These political solutions can be necessary can be necessary for a project to gain needed support to receive or maintain funding<sup>56</sup>.

An example of this differing of priorities can be seen in choices of routes. The best engineering solution was the most efficient route. The engineers would want to choose the route that most efficiently gets from one point to another point both in terms of distance and travel time and minimum cost. These factors were of concern to politicians also but they also had others that were at times more important. These factors could include the environment and social impact to areas where areas where the highways were built.

Early the building of the highways the best engineering solutions were often what was built. As the more highways were built there began to be increasing backlash to the effects the new highways were having. Building the highways displaced a large number of people especially in urban areas. As large elevated highways were built through neighborhoods it effectively split them in two with few routes from one side to the other. The presence of the highways also fundamentally changed neighborhoods both visually and with increased noise.

Transportation officials faced increasing resistance which resulted in the delay of many projects and even the outright cancellation of a few sections<sup>57</sup>. These routes may have provided users with efficient and cost-effective transportation and been excellent technical solutions but they were in some cases rejected by residents and local politicians because of their other impacts.

The effects the highways were having on the environment also became more evident. As result increasingly stringent environmental requirements were placed on the construction of new highways. Engineers also increasingly had to take into account how the new

highways would look visually as backlash began over how unappealing visually many of the highways were.

Bridges were increasingly designed to be more appealing architecturally. Additional resources were also put into landscaping along the interstates<sup>58</sup>. The best technical solution would have been to instead put these resources into building more roads with higher capacities. The politics forced these resources to instead be put toward other priorities.

Prior to the Federal-Aid Highway Act of 1956 states were working on and considering a number of different types of transportation projects. These projects could include rail, mass transit as well as different types of road networks. These projects were considered and selected based on their technical as well as political merits in their areas. With the passage of the Federal highway legislation states could receive 90% of the cost for highways meeting the Federal requirements<sup>59</sup>.

The Federal matching funds changed which projects were funded in states across the country. In many cases building highways meeting the Federal standards was not the best technical solution. In some cases states would have benefited more from a mass transit or rail project. The matching Federal funds made constructing the highways so appealing that resources were largely sucked away from other types of transportation projects so they could come up with the state's 10% share of the cost.

The timing of an event can greatly magnify or minimize the effect it has<sup>60</sup>. One example is the introduction of what became known as the Yellow book. The Yellow book was a report issued to members of Congress late in 1955 contained detailed maps showing the locations of the planned highways. This allowed members of Congress to see the benefits the proposed highways would have for their constituents. It proved to be key in changing their perception toward the highway system. The release of the report's impact was greatly magnified because of its timing just as consideration what became the Federal-Aid Highway Act of 1956 was beginning.

Another example of this is the effect increasingly gasoline prices had highway funding and the pace of construction. The highways were funded primarily out of a trust fund that received its revenue from gasoline taxes. Early in the project gas tax revenues were projected to steadily increase making it unnecessary to raise the tax rate. A rapid succession of world events including the Arab oil embargo and high inflation led to swelling gas prices and ultimately a reduction in revenue that greatly slowed construction progress<sup>61</sup>.

The higher gas prices caused people to drive less and purchase more fuel efficient cars. Since the gas tax was measured in cents per gallon instead of a percentage of gas price the effect was amplified. The falling revenues forced highway sections to be delayed due to insufficient funding. Had these events been more dispersed the effect would have greatly minimized.

The election cycle can also have an effect on the likelihood of projects passing. Shortly before elections politicians are even more cautious about how a particular vote will be perceived by voters. This may incent them to hurry legislation through so credit can be claimed or delay a difficult bill until after elections.

After the legislative session ended in 1955, passage for a new highway bill in 1956 looked less promising because it was a Presidential election year. The Democratically controlled Congress was expected to be leery of giving a Republican President a victory on his prize program shortly before his re-election bid. A major highway bill had not passed despite the considerable efforts of President Eisenhower during the last two years.

A few other events proved to be enough to overcome this challenge and allow the bill to pass. These included the issuance of the Yellow book which made members of Congress anxious to get projects started in their districts because they were also up for re-election. Also important was industry groups changing their view of the highway legislation.

Just as technical problems can create political problems it can also go the other way with political problems creating technical problems. Political problems can necessitate additional work<sup>62</sup>. An example of this was the routing of highways near urban cores. Original plans called for highways to go around cities, but urban plans, downtown interests and local politicians called for and lobbied Congress until they were successful in getting the highway bill amended in 1956. They saw the new highways as a method to clear slums and remove blight.

Going around cities was much simpler and less expensive. The plan was amended after the local interests were able to put enough political pressure on Congress for the bill to be changed. Putting the highways through urban cores created significant technical challenges to overcome as well as added enormous cost to the system.

Politicians can be very focused on the short term. Much of this grows out of necessity to show benefits from the projects and programs they support so they can be re-elected. They can also feel pressure because current opportunity may not be present in future. It can be better to get something done now over the possibility of getting something potential better farther down the road<sup>63</sup>.

Prior to the passage of the highway bill in 1956 President Eisenhower had been a supporter of bond financing for the proposed highway system. He felt strongly that it was important for the new highways to be built as quickly as possible. He was running into stiff opposition from Senator Harry Byrd of the Finance Committee who strongly favored pay as you go financing.

The President was also strongly motivated to get project started and as result changed his support from the Clay Plan to pay as you go financing to as he described it “to get the job done<sup>64</sup>.”

A memorable name or slogan can play a role in the political process by attracting more attention which can help build or maintain a strong constituency<sup>65</sup>. This was seen with a name change for the proposed highway system. The name was changed to “National System of Interstate and Defense Highways<sup>66</sup>” adding the reference to defense. This made an important difference in the perception of the benefits of the program.

The proposed highway system was expected to be of some benefit to the military especially in the event of a war. Civilians were expected to be the primary usage but National defense was a very important consideration as the country was in the midst of the Cold War. It helped the proposed system to get attention and support as being important to National defense even if it was not the primary purpose.

How something is perceived by the political process can be a more important consideration than the truth<sup>67</sup>. This can be the case when a minor problem is perceived to be catastrophic or when a significant strength is proclaimed when it is actually very minor. An example of this fact of life was seen in the period of time preceding the construction of the highway system. The events during this period were important for formulating ideas and building public support for the creation of a highway system.

The 1939 New York World’s Fair featured a prominent exhibit created by Norman Bel Geddes which showcased an imagined road network of the 1960s entitled “Futurama.” It was intended to demonstrate new ideas for fast automotive travel. The exhibit featured 14 lane super highways on multiple levels travelling at very high speeds. It even included advanced features such as using radio signals to regulate spacing between vehicles.

The ideas demonstrated were far beyond what would be possible technologically or economically in the 1960s but they did play an important role in getting the general public excited by the concept of a high-speed highway network<sup>68</sup>. It didn’t really matter the system that began to come to fruition in the late 1950’s would be far more modest; it showed concepts that were very exciting and appealing to people at the time who would be willing to support an interstate system in the future.

How something is measured is a way of showing priorities and it can have a tremendous impact on a project. Measurement decisions can greatly influence funding levels and distributions. As result decisions of how to measure can create political controversies with competing interest groups favoring the method of measurement that provides an advantage for their cause.

The interstate highway system had an example of this on whether a funding formula would use lane miles or center line miles. Representatives from rural areas advocated center line miles because the highways would have few lanes in rural areas giving them additional funding when compared to measuring using center line miles that was preferred by the representatives from urban areas that often had far more than the minimum two lanes in each direction. Urban interests clearly favored the opposite. The controversy was eventually decided by creating a compromise in a House-Senate conference<sup>69</sup>.

Politics can change a situation very quickly. These political changes can be caused by new information, events, or changes in support from constituencies or opponents. These events can allow a proposal without much hope to pass and equally for other proposals that look like a shoe in to unexpectedly fail to pass.

Prior to the passage of the Federal-Aid Highway Act Of 1956 there was a prominent bill named after its sponsor known as the Fallon bill. Before the Fallon bill there had been a number of other bills that had failed to garner sufficient support. The Fallon bill was the first bill that was widely expected to pass. Some industry groups with a strong interest in the bill were so confident of its passage that they didn't actively lobby for its passage. However, the bill it not pass a vote in either house of Congress<sup>70</sup>.

These industry groups learned their lesson and did actively lobby for the next major bill which did end up passing. Another key point to remember is that even after project or program is started continued support is necessary to maintain resources in future years.

## **6 Summary**

The impact the creation of the interstate highway system has had on the development of the country is difficult to overstate. Its impact continues to be felt in our cities and communities. This paper has included a brief history of the beginnings of the interstate highway system. It focused on how the political process has impacted the inception and development of the highway system. The paper also included an analysis of the affects the political process has had.

This analysis took the form of common themes that are seen in projects as they encounter the political process. These themes are referred to as political facts of life. The analysis included five common themes, a few additional themes and a few new ones that were identified during the analysis.

Understanding the impacts the political facts of life have had on the interstate highway system can aid in understanding how the system developed the way that it did. Perhaps more importantly understanding how the interstate highway system was impacted by the political process can help in understanding how these same influences can affect other projects. The political facts of life have been identified in projects long before the interstate highway system and continue to be seen in current projects. The challenges are the same, but they manifest themselves in new ways on each project.

An understanding of the political facts of life and how it has influenced past projects and will influence current and future projects can help citizens, engineers and program managers better understand why changes happened in the past and leave them better prepared to foresee and prepare for the impact of the political process in the future. The political facts of life will continue to influence projects and these influences can't be ignored.

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